The High Angular Resolution Multiplicity of Massive Stars

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Conducted on NOAO 4-m telescopes in 1994, the first speckle survey of O stars (Mason et al. 1998) had success far in excess of our expectations. In addition to the frequently cited multiplicity analysis, many of the new systems which were first resolved in this paper are of significant astrophysical importance. Now, some ten years after the original survey, we have re-examined all systems analyzed before. Improvements in detector technology allowed for detection of companions missed before as well as systems which may have been closer than the resolution limit in 1994. Also, we made a first high-resolution inspection of the additional O stars in the recent Galactic O Star Catalog of Maíz-Apellániz & Walborn (2004). In these analyses we resolved four binaries not detected in 1994 due to the enhanced detection capability of our current system or kinematic changes in their relative separation. We also recovered four pairs, confirming their original detection. In the new sample, stars are generally more distant and fainter, decreasing the chance of detection. Despite this, eight pairs were detected for the first time.

In addition to many known pairs observed for testing, evaluation and detection characterization, we also investigated several additional samples of interesting objects, including accessible Galactic WR stars from the contemporaneous speckle survey of Hartkopf et al. (1999), and massive, hot stars with separations which would indicate their applicability for mass determinations (for fully detached O stars masses are presently known for only twelve pairs). In these observations, in addition to those enumerated above we resolved seventeen pairs for the first time.

Massive stars have also been a important bserving program for the CHARA Array. Preliminary results from Separated Fringe Packet solutions of interferometric binaries are also presented.